

### REMARKS

Claims 26-40 are pending in the application. Claims 1-25 were previously cancelled without prejudice. Reconsideration and withdrawal of the outstanding rejections are respectfully requested in view of the following remarks.

Claims 26-27 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,358,901 to Fiordalice et al. (“Fiordalice”) in view of U.S. Patent No. 6,268,284 to Cerio, Jr. (“Cerio”). This rejection is respectfully traversed.

In accordance with M.P.E.P. § 2142, in order to establish a *prima facie* obviousness rejection, there must be some “suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings.” And, in considering any patent as a reference for 35 U.S.C. § 103 purposes, it must be considered as a whole, including any “teaching away” from combining it with the other references. M.P.E.P. § 2141.02. As stated in M.P.E.P. § 2145(X)(2), “It is improper to combine references where the references teach away from their combination.” (citing In re Graselli, 713 F.2d 731, 743 (Fed. Cir. 1983)).

Despite the Office Action’s assertion that “it would have been obvious to one of ordinary skill in the art at the time the invention was made” to combine Fiordalice with the teachings of Cerio, Cerio teaches away from any combination with Fiordalice, and *vice versa*. The references, therefore, do not establish a *prima facie* obviousness rejection.

Fiordalice discloses a process of forming an intermetallic bottom layer of a via hole by reacting a metal-containing layer with a metal-containing gas. More specifically, Fiordalice discloses reacting gaseous titanium tetrachloride with aluminum to form titanium aluminide on the bottom of a via hole. Cerio, on the other hand, discloses a method of sputtering titanium aluminide on the bottom and sidewalls of a via.

Applicant respectfully submits that the two references explicitly teach away from their combination. Fiordalice teaches away from using Cerio's sputtering techniques, stating, "titanium aluminide is formed by reacting gaseous titanium tetrachloride with aluminum in the interconnect without sputtering or evaporating titanium." (Col. 4, lines 27-30). Fiordalice explains that sputtering leaves unwanted titanium on the sidewalls of the via: "[i]f the titanium-sputter method was used to form titanium aluminide within the via opening. . . unreacted titanium probably would lie on the ILD layer 51 and on the titanium aluminide that is formed at the bottom of the via opening." (Col. 5, lines 7-12). Cerio, likewise, teaches away from the method of Fiordalice, stating "when Ti and Al are reacted to form  $TiAl_3$ , undesirable roughening of the interface between  $TiAl_3$  and the overlying Al layer is observed." (Col. 5, lines 23-25). Cerio explains that using this method, as Fiordalice teaches, produces a layer that is not smooth, and therefore undesirable for Cerio's method.

Thus, one of ordinary skill in the art would not be motivated to combine Fiordalice with Cerio because each reference teaches away from using the method of the other. The combination of references is therefore improper according to M.P.E.P. § 2145, and withdrawal of the 35 U.S.C. § 103(a) rejection of claims 26 and 27 is respectfully requested.

Claims 28-40 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Fiordalice in view of Cerio and further in view of U.S. Patent No. 5,313,101 to Harada et al. ("Harada"). This rejection is respectfully traversed.

For at least the reasons set forth above with respect to claims 26 and 27, Applicant respectfully submits that the combination of Fiordalice and Cerio is improper. Despite whatever Harada may disclose about an antireflective coating and conductive plugs, Harada does not provide any motivation to combine these three references to produce the claimed invention. Further, Harada cannot be separately combined with either Fiordalice or Cerio, individually, so as to have rendered the subject matter of these

claims obvious. Harada simply cannot remedy either reference's lack of teaching or suggestion of the claimed subject matter.

For at least these reasons, withdrawal of the 35 U.S.C. § 103(a) rejection of claims 28-40 is respectfully requested.

In view of the above, each of the presently pending claims in this application is believed to be in immediate condition for allowance. Accordingly, the Examiner is respectfully requested to pass this application to issue.

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Respectfully submitted,

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